

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : S. Narayanan et al. Art Unit: 1746  
 Serial No.: 10/722,352 Examiner: Unknown  
 Filed : November 24, 2003  
 Title : WATER FREE PROTON CONDUCTING MEMBRANES BASED ON  
 POLY-4-VINYLPYRIDINEBISULFATE FOR FUEL CELLS

Commissioner for Patents  
 P.O. Box 1450  
 Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

Applicants call attention to the attached Information Disclosure Statement and documents listed on form PTO-1449. Applicant has not provided copies of the US patents in accordance with the waiver posted on the USPTO website.

This filing is being made before the receipt of a first Office action on the merits. No fee is required.

The documents are in the English language; hence no concise explanation is necessary per Rule 98(a)(3). However, there is no English translation readily available for Item AAAAAAAA.

## CERTIFICATE OF MAILING BY FIRST CLASS MAIL

I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

JUNE 15, 2004

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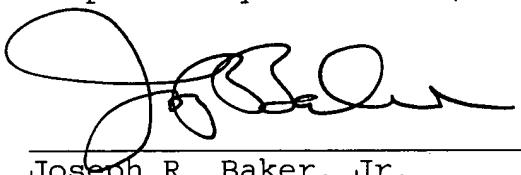
Susan Sesnovich

Signature  
 SUSAN SESNOVICH  
 Typed or Printed Name of Person Signing  
 Certificate

Consideration of the foregoing and enclosures plus the return of a copy of the enclosed form PTO-1449 with the Examiner's initials in the left column per MPEP 609 are earnestly solicited along with an early action on the merits.

Please apply any additional charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,



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10405593.doc

Substitute Form PTO-1449 (Modified)		U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 06618-920001	Application No. 10/722,352
<b>Information Disclosure Statement</b> <b>by Applicant</b> (Use several sheets if necessary) (37 CFR § 1.56(b))		Applicant S. Narayanan et al.		
		Filing Date November 24, 2003	Group Art Unit 1746	

### U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	AA	6,703,150	March 9, 2004	Surampudi, et al.			
	AB	6,680,139	Jan 20, 2004	Narayanan, et al.			
	AC	6,589,684	July 8, 2003	Surampudi, et al.			
	AD	6,533,919	Mar 18, 2003	Narayanan, et al.			
	AE	6,485,851	Nov 26, 2002	Narayanan, et al.			
	AF	6,468,684	Oct 22, 2002	Chisholm, et al.			
	AG	6,444,343	Sept 3, 2002	Prakash, et al.			
	AH	6,440,594	Aug 27, 2992	Kindler, et al.			
	AI	6,432,284	Aug 13, 2002	Narayanan, et al.			
	AJ	6,420,059	July 16, 2002	Surampudi, et al.			
	AK	6,391,486	May 21, 2002	Narayanan, et al.			
	AL	6,368,492	April 9, 2002	Narayanan, et al.			
	AM	6,306,285	Oct 23, 2001	Narayanan, et al.			
	AN	6,303,244	Oct 16, 2001	Surampudi, et al.			
	AO	6,299,744	Oct 9, 2001	Narayanan, et al.			
	AP	6,277,447	Aug 21, 2001	Chun, et al.			
	AQ	6,265,093	July 24, 2001	Surampudi, et al.			
	AR	6,254,748	July 3, 2001	Surampudi, et al.			
	AS	6,248,460	June 19, 2001	Surampudi, et al.			
	AT	6,221,523	April 24, 2001	Chun, et al.			
	AU	6,171,721	Jan 9, 2001	Narayanan, et al.			
	AV	6,146,781	Nov 14, 2000	Surampudi, et al.			
	AW	5,945,231	Aug 31, 1999	Narayanan, et al.			
	AX	5,795,496	Aug 18, 1998	Yen, et al.			
	AY	5,773,162	June 30, 1998	Surampudi, et al.			
	AZ	5,599,638	Feb 4, 1997	Surampudi, et al.			
	AAA	3,899,354	Aug 12, 1975	Kordesch			

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EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

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U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	ABB	4,125,676	Nov 14, 1978	Maricle, et al.			
	ACC	4,350,608	Sept 21, 1982	Gestaut			
	ADD	4,395,322	July 26, 1983	Harris			
	AEE	4,478,917	Oct 23, 1984	Fujita, et al.			
	AFF	4,526,843	July 2, 1985	Kaufman, et al.			
	AGG	4,629,664	Dec 16, 1986	Tsukui, et al.			
	AHH	4,728,533	Mar 1, 1988	Feigenbaum, et al.			
	AII	4,766,043	Aug 23, 1988	Shirogami, et al.			
	AJJ	4,810,597	Mar 7, 1989	Kumagai, et al.			
	AKK	4,824,739	Apr 25, 1989	Breault, et al.			
	ALL	4,828,941	May 9, 1989	Sterzel			
	AMM	5,013,618	May 7, 1991	Luczak			
	ANN	5,225,391	July 6, 1993	Stonehart, et al.			
	AOO	5,294,232	Mar 15, 1994	Sakairi, et al.			
	APP	5,294,580	Mar 15, 1994	Dufner			
	AQQ	5,308,465	May 3, 1994	Hillrichs, et al.			
	ARR	5,330,860	July 19, 1994	Grot, et al.			
	ASS	5,366,821	Nov 22, 1994	Merritt, et al.			
	ATT	5,415,888	May 16, 1995	Banerjee, et al.			
	AUU	5,436,086	July 25, 1995	Seymour, et al.			
	AVV	5,561,000	Oct 1, 1996	Dirven, et al.			
	AWW	5,928,807	July 27, 1999	Elias			
	AXX	5,432,023	July 11, 1995	Yamada, et al.			
	AYY	5,709,961	Jan 20, 1998	Cisar, et al.			
	AZZ	5,863,672	Jan 26, 1999	Ledjeff, et al.			
	AAAA	5,925,477	July 20, 1999	Ledjeff, et al.			
	ABBB	5,952,118	Sept 14, 1999	Ledjeff, et al.			

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U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	ACCC	6,054,228	April 25, 2000	Cisar, et al.			
	ADDD	6,214,485	April 10, 2001	Barnett, et al.			
	AEEE	6,479,178	Nov 12, 2002	Barnett			
	AFFF	4,365,008	Dec 21, 1982	DeCasperis, et al.			
	AGGG	4,588,661	May 13, 1986	Kaufman, et al.			
	AHHH	5,236,687	Aug 17, 1993	Fukuda, et al.			
	AIII	5,252,410	Oct 12, 1993	Wilkinson, et al.			
	AJJJ	5,482,792	Jan 9, 1996	Faita, et al.			
	AKKK	5,641,586	June 24, 1997	Wilson			
	ALLL	5,858,569	Jan 12, 1999	Meacher, et al.			
	AMMM	6,258,476	July 10, 2001	Cipollini			
	ANNN	3,013,098	Dec 12, 1961	Hunger, et al.			
	AOOO	3,143,440	Aug 4, 1964	Hunger, et al.			
	APPP	3,409,520	Nov 5, 1968	Bolmer			
	AQQQ	4,011,149	Mar 8, 1977	Nozik			
	ARRR	4,085,709	April 25, 1978	Tangri			
	ASSS	4,175,013	Nov 20, 1979	Barnert, et al.			
	ATTT	4,248,941	Feb 3, 1981	Louis, et al.			
	AUUU	4,257,856	Mar 24, 1981	Beni, et al.			
	AVVV	4,390,603	June 28, 1983	Kawana, et al.			
	AWWW	4,431,608	Feb 14, 1984	Katagiri, et al.			
	AXXX	4,465,570	Aug 14, 1984	Oda, et al.			
	AYYY	4,594,297	June 10, 1986	Polak, et al.			
	AZZZ	4,699,700	Oct 13, 1987	Dhooge			
	AAAAA	5,037,518	Aug 6, 1991	Young, et al.			
	ABBBB	5,394,852	Mar 7, 1995	McAlister			
	ACCCC	5,513,600	May 7, 1996	Teves			

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Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	ADDDD	5,592,028	Jan 7, 1997	Pritchard			
	AEEEE	5,800,938	Sept 1, 1998	Watanabe			
	AFFFF	5,840,172	Nov 24, 1998	Zugravu			
	AGGGG	4,349,613	Sept 14, 1982	Winsel			
	AHHHH	5,141,823	Aug 25, 1992	Wright, et al.			
	AIIII	5,445,905	Aug 29, 1995	Marsh, et al.			
	AJJJJ	5,599,639	Feb 4, 1997	Sansone, et al.			
	AKKKK	4,659,559	April 21, 1987	Struthers			
	ALLLL	4,985,315	Jan 15, 1991	Lemoine			
	AMMMM	5,344,548	Sept 6, 1994	Alberti, et al.			
	ANNNN	5,436,094	July 25, 1995	Horimoto, et al.			
	AOOOO	5,573,648	Nov 12, 1996	Shen, et al.			
	APPPP	5,576,115	Nov 19, 1996	Capuano, et al.			
	AQQQQ	5,591,545	Jan 7, 1997	Miyashita, et al.			
	ARRRR	5,766,799	June 16, 1998	Hong			
	ASSSS	6,001,507	Dec 14, 1999	Ono, et al.			
	ATTTT	6,059,943	May 9, 2000	Murphy, et al.			
	AUUUU	3,423,228	Jan 21, 1969	Oster, et al.			
	AVVVV	4,419,209	Dec 6, 1983	Klinkowski			
	AWWWW	4,537,840	Aug 27, 1985	Tsukui, et al.			
	AXXXX	4,596,858	June 24, 1986	Gregor, et al.			
	AYYYY	4,605,685	Aug 12, 1986	Momose, et al.			
	AZZZZ	4,729,930	Mar 8, 1988	Beal, et al.			
	AAAAAA	5,049,275	Sept 17, 1991	Gillberg-Laforce, et al.			
	BBBBBB	5,260,143	Nov 9, 1993	Voss, et al.			
	ACCCCC	5,460,896	Oct 24, 1995	Takada, et al.			
	ADDDDD	5,523,177	June 4, 1996	Kosek, et al.			

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U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	AEEEEEE	5,599,640	Feb 4, 1997	Lee, et al.			
	AFFFFF	5,643,689	July 1, 1997	Flesicher, et al.			
	AGGGGG	5,645,950	July 8, 1997	Benz, et al.			
	AHHHHHH	5,679,482	Oct 21, 1997	Ehrenberg, et al.			
	AIIIII	5,834,523	Nov 10, 1998	Steck, et al.			
	AJJJJJ	5,919,583	July 6, 1999	Grot, et al.			
	AKKKKK	3,581,462	June 1, 1971	Stump			
	ALLLLL	3,982,961	Sept 28, 1976	Grasso			
	AMMMMI	4,354,861	Oct 19, 1982	Kalt			
	ANNNNN	4,729,931	March 8, 1988	Grimble			
	AOOOOC	5,047,299	Sept 10, 1991	Shockling			
	APPPPP	5,164,060	Nov 17, 1992	Eisman, et al.			
	AQQQQQ	5,169,730	Dec 8, 1992	Reichner, et al.			
	ARRRRR	5,527,631	June 18, 1996	Singh, et al.			
	ASSSSS	5,582,632	Dec 10, 1996	Nohr, et al.			
	ATTTTT	5,593,721	Jan 14, 1997	Daidai, et al.			
	AUUUUU	5,634,341	June 3, 1997	Klanchar, et al.			
	AVVVVV	5,851,689	Dec 22, 1998	Chen			
	WWWWWW	6,033,793	Mar 7, 2000	Woods, et al.			
	AXXXXXX	6,045,772	April 4, 2000	Szydlowski, et al.			
	YYYYYY	6,136,463	Oct 24, 2000	Kindler, et al.			
	AZZZZZ	6,274,260	Aug 14, 2001	Schuler			
	AAAAAA	4,644,751	Feb 24, 1987	Hsu			
	BBBBBB	5,401,589	Mar 28, 1995	Palmer, et al.			
	CCCCCC	5,916,505	June 29, 1999	Cisar, et al.			
	DDDDDD	4,390,603	June 28, 1983	Kawana, et al.			
	AEEEEEE	5,316,871	May 31, 1994	Swathirajan, et al.			

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U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	AFFFFF	5,330,626	July 19, 1994	Banerjee			
	AGGGGG	5,399,184	Mar 21, 1995	Harada, et al.			
	AHHHHH	4,341,608	July 27, 1982	St. John			
	AIIIII	5,176,809	Jan 5, 1993	Simuni			
	AJJJJJ	3,410,780	Nov 12, 1968	Holden			
	AKKKKK	3,464,008	Aug 26, 1969	Meysson, et al.			
	ALLLLL	3,480,520	Nov 25, 1969	Smith			
	MMMMMM	4,003,705	Jan 18, 1977	Buzza, et al.			
	ANNNNN	4,025,412	May 24, 1977	LaConti			
	AOOOOO	4,575,410	Mar 11, 1986	Neti			
	APPPPP	4,744,954	May 17, 1988	Campbell, et al.			
	AQQQQQ	4,752,361	June 21, 1988	Gautschi			
	ARRRRR	4,875,900	Oct 24, 1989	Singh, et al.			
	ASSSSSS	5,118,398	June 2, 1992	McElroy, et al.			
	ATTTTT	5,151,166	Sept 29, 1992	Harral, et al.			
	AUUUUU	5,173,166	Dec 22, 1992	Tomantschger, et al.			
	AVVVVV	5,322,602	June 21, 1994	Razaq			
	WWWWWW	5,518,830	May 21, 1996	Worrell, et al.			
	AXXXXX	5,897,766	April 27, 1999	Kawatsu			
	YYYYYY	4,738,903	April 19, 1988	Garow, et al.			
	AZZZZZ	4,745,953	May 24, 1988	Kobayashi, et al.			
	AAAAAA	5,335,628	Aug 9, 1994	Dunbar			
	BBBBBB	3,776,462	Dec 4, 1973	Payne, Jr., et al.			
	CCCCCC	5,547,911	Aug 20, 1996	Grot			
	DDDDDD	5,998,057	Dec 7, 1999	Koschany, et al.			
	AEEEEEE	4,130,484	Dec 19, 1978	Marwil, et al.			
	AFFFFF	5,019,263	May 28, 1991	Haag, et al.			

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U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	GGGGGG	5,250,184	Oct 5, 1993	Maier			
	HHHHHH	5,603,830	Feb 18, 1997	Everhart, et al.			
	AIIIIII	5,679,248	Oct 21, 1997	Blaney			
	AJJJJJJ	5,935,431	Aug 10, 1999	Korin			
	KKKKKK	3,993,985	Nov 23, 1976	Chopard, et al.			
	LLLLLL	5,431,789	July 11, 1995	Huber, et al.			
	IMMMMM	5,598,088	Jan 28, 1997	Richter			
	NNNNNN	5,658,682	Aug 19, 1997	Usuda, et al.			
	OOOOOO	5,698,089	Dec 16, 1997	Lewis, et al.			
	APPPPPP	5,733,437	Mar 31, 1998	Baker, et al.			
	QQQQQQ	5,814,995	Sept 29, 1998	Tasdighi			
	ARRRRRR	3,113,049	Dec 3, 1963	Worsham			
	ASSSSSS	3,368,922	Feb 13, 1968	Salyer			
	ATTTTTT	4,262,063	April 14, 1981	Kudo, et al.			
	UUUUUU	4,407,905	Oct 4, 1983	Takeuchi, et al.			
	VVVVVV	4,420,544	Dec 13, 1983	Lawson, et al.			
	WWWWW	4,493,878	Jan 15, 1985	Horiba, et al.			
	XXXXXX	4,562,123	Dec 31, 1985	Shimizu, et al.			
	YYYYYY	4,612,261	Sept 16, 1986	Tsukui, et al.			
	AZZZZZZ	4,828,941	May 9, 1989	Sterzel			
	AAAAAA	4,876,115	Oct 24, 1989	Raistrick			
	BBBBBBI	5,186,877	Feb 16, 1993	Watanabe			
	CCCCCCC	4,275,126	June 23, 1981	Bergmann, et al.			
	DDDDDD	4,882,232	Nov 21, 1989	Bugnet, et al.			
	EEEEEEE	5,084,144	Jan 28, 1992	Reddy, et al.			
	AFFFFFF	5,242,764	Sept 7, 1993	Dhar			
	GGGGGG	5,277,996	Jan 11, 1994	Marchetti, et al.			

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<b>U.S. Patent Documents</b>							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
HHHHHHH		5,512,152	April 30, 1996	Schicht, et al.			
AIIIIIIII		5,750,013	May 12, 1998	Lin			
AJJJJJJJJ		4,711,907	Dec 8, 1987	Sterzel, et al.			
KKKKKKK		5,013,765	May 7, 1991	Sluma, et al.			
LLLLLLL		5,468,574	Nov 21, 1995	Ehrenberg, et al.			
MMMMMM	US 2003-0148162A1		Aug 7, 2003	Narayanan, et al.			

<b>Foreign Patent Documents or Published Foreign Patent Applications</b>							
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation
							Yes No
NNNNNNN	JP63-076264		Apr 6, 1988	JP			Abstract only
DOOOOOO	JP2148657		June 7, 1990	JP			Abstract only
APPPPPPP	DE4243600		July 1, 1993	DE			Abstract only
QQQQQQQ	EP0248394		Dec 9, 1987	EP			Abstract equivalent
RRRRRRR	EP0546594		June 16, 1993	EP			Abstract equivalent
ASSSSSSS	JP60151969		Aug 10, 1985	JP			Abstract only
TTTTTTT	JP64077876		Mar 23, 1989	JP			Abstract only
JUUUUUU	EP0818841		Jan 14, 1998	EP			Abstract only
VVVVVVV	JP59209277		Nov 27, 1984	JP			Abstract only
WWWWW	JP60165062		Aug 28, 1985	JP			Abstract only
XXXXXX	DE3110571		Sept 30, 1982	DE			Abstract only
YYYYYYY	EP0629013		Dec 14, 1996	EP			Abstract only
ZZZZZZZ	EP0716463		June 12, 1996	EP			Abstract only
AAAAAAA	FR1436154		April 22, 1966	FR			X

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							Yes	No
JBBBBBBB	JP6188008	July 8, 1994	JP				Abstract only	
JCCCCCCC	JP06251779	Sept 9, 1994	JP				Abstract only	
JDDDDDDD	EP0241432	Oct 14, 1987	EP				Abstract only	
JEEEEEEE	JP02-051865	Feb 21, 1990	JP				Abstract only	

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	JFFFFFFF	Narayanan, et al., "Studies on the Electro-Oxidation of Methanol and Formaldehyde at Carbon-Supported Platinum and Platinum Alloy Electrodes", 1046b Extended Abstracts, Spring Meeting, October 11-16, 1992, St. Louis Missouri, 92/2, pp. 78-79
	JGGGGG	Narayanan, et al., "Implications of Fuel Crossover in Direct Methanol Fuel Cells", 1046b Extended Abstracts, Fall Meeting, October 10-15, 1993, New Orleans, Louisiana, 93/2, pp. 126-127
	JHHHHHH	Zawodzinski, et al., "Methanol Cross-over in DMFC's: Development of Strategies for Minimization", 1046b Extended Abstracts, Spring Meeting, October 9-14, 1994, St. Louis, Missouri, 94/2, p. 960
	JAIIIIII	Kosek, et al., "A Direct Methanol Oxidation Fuel Cell", Proceeding of the 28 <sup>th</sup> Intersociety Energy Conversion Engineering Conference, Vol. 1, August 8, 1993, pp. 11209-11214,
	JAJJJJJJ	Hamnett, et al., "Electrocatalysis and the Direct Methanol fuel Cell", <u>Chemistry and Industry</u> , No. 13, pp. 480-483, July 6, 1992
	JKKKKKK	Skerrett, "Fuel Cell Update", <u>Popular Science</u> , pp. 88-91, pp. 120-121, June, 1993
	JLLLLLL	Watanabe, et al., "Applications of the Gas Diffusion Electrode to a Backward Fee and Exhaust (BFE) Type Methanol Anode", <u>J. Electroanal. Chem.</u> , Vol. 199, pp. 311-322, 1986
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Substitute Form PTO-1449 (Modified)	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 06618-920001	Application No. 10/722,352
<b>Information Disclosure Statement by Applicant</b> (Use several sheets if necessary) (37 CFR §1.98(b))		Applicant <b>S. Narayanan et al.</b>	
		Filing Date November 24, 2003	Group Art Unit 1746

<b>Other Documents (include Author, Title, Date, and Place of Publication)</b>		
Examiner Initial	Desig. ID	Document
	SSSSSSS	Kawashima, et al., "Surface-Activated Amorphous Alloy Fuel Electrodes for Methanol Fuel Cell", <u>Science Reports of the Research Institutes</u> , Tohoku University, Series A: Physics, Chemistry, and Metallurgy, Sendai, Japan, Vol. 31, no. 1, pp. 174-182 (date not provided)
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